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PROTECTING COVER CROPS AND FALL-SOWN GRAINS FROM GRASSHOPPER DAMAGE IN THE PRAIRIE PROVINCES

BY L. G. PUTNAM

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THE MAIN POINTS

MAKE GRASSHOPPER CONTROL A PART OF YOUR NORMAL FARMING PRACTICE BY:-

mouldboard ploughing where the practice is normal (egg stage);

starvation by early summer-fallowing (young 'hoppers).

MINIMIZE DAMAGE BY:-

getting cover crops off to a strong early start in a good seed-bed (summer-fallow early);

increasing rate of seeding of cover crops on outer edges of fields (double-seed or use close drill-row spacing).

USE CHEMICAL CONTROL:-

Watch for and kill marginal grasshopper infestations before cover crops, winter wheat, or fall rye emerge.

Repeat treatments as necessary.

Cover both the "front", where the damage is taking place, and the "rear", where the grasshoppers roost.

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PROTECTING COVER CROPS AND FALL-SOWN GRAINS FROM GRASSHOPPER DAMAGE IN THE PRAIRIE PROVINCES [1]

By

L.G. Putnam
Field Crop Insect Section, Laboratory of Entomology
Saskatoon, Sask.

Farmers in Western Canada who grow cover crops, winter wheat, and fall rye often have to deal with a special grasshopper problem. Grasshoppers in numbers that constitute no particular threat to spring crops may damage late-sown crops severely. The problem arises from the facts that when these crops are emerging they are naturally very susceptible to damage and that the grasshoppers are full-grown and feed heavily.

Low infestations can cause this damage because the grasshoppers concentrate along roadsides, fence rows, and particularly the margins of maturing crops and stubble standing next to fields to be sown to cover crops or winter grains. The full-fledged grasshoppers tend to move out to the edges of tall, rank, standing crops, to find a place where they can bask in the sunshine during the day, find a good food supply easily, and still take shelter in the crop at night. Hence, even before cover crops or winter grains are sown, the grasshoppers are in position to attack them on the day they come up.

The concentration of grasshoppers along the edges of fields or strips carrying maturing crops may persist and even increase after the crops are ripe and harvested. This applies particularly during dry falls, when stubble may carry very little green weed growth; under these conditions the grasshoppers have to seek a few green weeds usually to be found along the edge of the stubble.

If <u>all</u> the grasshoppers were gathered along the edges of fields carrying maturing crops, it would be relatively simple to destroy them before the late-sown seedlings emerge. Unfortunately this is not usually the case. Part of the population of grasshoppers often remains thinly scattered through the maturing crop or stubble field, and gradually works its way to the outer edge of the field or strip. You may therefore have to repeat control treatments as reinfestation occurs.

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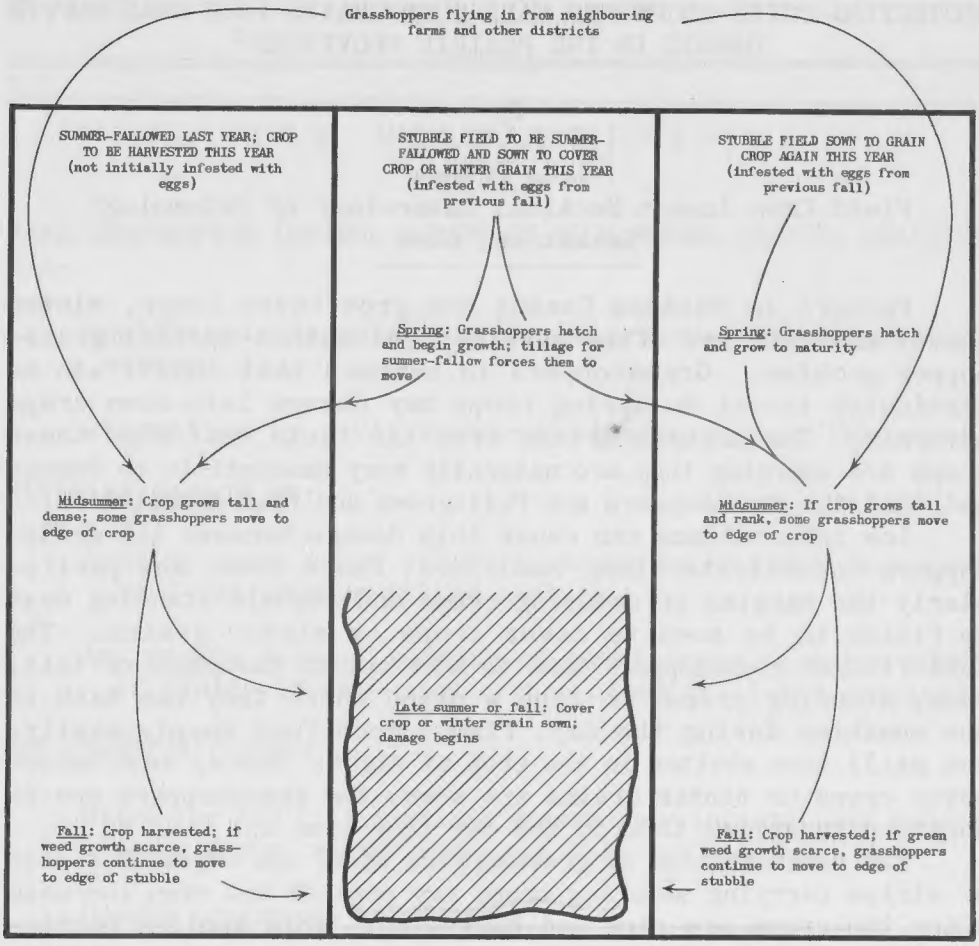
Grasshoppers flying in from neighbouring farms and other districts
SUMMER-FALLOWED LAST YEAR; CROP TO BE HARVESTED THIS YEAR (not initially infested with eggs)
STUBBLE FIELD TO BE SUMMER-FALLOWED AND SOWN TO COVER CROP OR WINTER GRAIN THIS YEAR (infested with eggs from previous fall)
STUBBLE FIELD SOWN TO GRAIN CROP AGAIN THIS YEAR (infested with eggs from previous fall)
Spring: Grasshoppers hatch and begin growth; tillage for summer-fallow forces them to move
Spring: Grasshoppers hatch and grow to maturity
Midsummer: Crop grows tall and dense; some grasshoppers move to edge of crop
Midsummer: If crop grows tall and rank, some grasshoppers move to edge of crop
Late summer or fall: Cover crop or winter grain sown; damage begins
Fall: Crop harvested; if weed growth scarce, grasshoppers continue to move to edge of stubble
Fall: Crop harvested; if green weed growth scarce, grasshoppers continue to move to edge of stubble

Figure 1. Possible sources and movements of grasshoppers that attack cover crops, winter wheat, or fall rye.

GENERAL PREVENTIVE CONTROL MEASURES

Figure 1 indicates a number of possible sources of grasshoppers that, when mature, attack cover or other late-sown crops. One of these sources is the same field in which the seedling crop is later attacked. If you delay the first summer-fallow tillage operation on a field later to be sown to such a

crop until after the grasshopper eggs in it hatch, the 'hopper infestation will naturally be forced to move to the nearby grain crops. Often few in number, they may easily go unnoticed at this stage. You can handle this situation in one of two ways:-

1. Do the first summer-fallow tillage operation early, before the grasshoppers hatch. If the field is left free of all green plants that 'hoppers require for food, newly hatched 'hoppers will often fail to move to a food supply and will starve in a few days.

2. If young 'hoppers are forced off a field being tilled, poison them while they are still concentrated along the margins of the adjacent invaded crop, even if the 'hoppers are so few and the crop so well developed that no visible damage is taking place. While doing this, poison the 'hoppers along grassy roadsides and fence rows as well.

Since all stubble fields are likely to contain at least a few grasshopper eggs, any fields sown to crops for the second year in succession are almost sure to produce grasshoppers of their own. These will often go completely unnoticed until they move to attack the late-sown crop. If deep mouldboard ploughing is a standard practice, it will prevent the emergence of many grasshoppers at hatching time, but there is no other tillage treatment certain to control enough of the grasshoppers to remove this threat. Where it is a bad practice to plough, only a general chemical control treatment, after the 'hoppers have all hatched and the crop is well up, wil ensure destruction of the 'hoppers from this source.

MANAGEMENT PRACTICES TO KEEP DOWN GRASSHOPPER DAMAGE TO COVER CROPS

Standard Drill-row Spacing

The custom of seeding cover crops in widely spaced drill-rows, at low rates per acre, is likely to increase damage. Attacking grasshoppers have to move farther and damage more acres to get enough to eat in young crops sown in this way. In seeding the first round or two of a cover crop, use the normal spacing of six or seven inches between the drill-rows, and use a heavier rate. Many farmers will have noticed that double-sown spots in fields, such as corners, are the last to go down under grasshopper attack.

Encouraging Early, Vigorous Growth

Any management practice that will get the cover crop off to a strong, fast-growing start will enable it to develop to a stage at which it can resist damage that much sooner. Early seeding into a firm seed-bed with a good moisture supply contributes to this. Early preparation of summer-fallow, previously mentioned as useful in the spring control of grasshoppers, will in turn help to have this kind of seed-bed ready at the earliest date that a cover crop can be sown.

PROTECTING SEEDLING COVER CROPS AND WINTER GRAINS WITH GRASSHOPPER POISONS

In spite of all measures that an individual can adopt beforehand to protect the late sown crops that he expects to put in, he may find himself with a grasshopper problem when the crops come up. Such 'hoppers may have moved in from neighbouring districts, or possibly have migrated from a long distance. When seeding these crops, look closely for grasshoppers while running the drill next to maturing crops or stubble; if noticeable numbers are present, poison them with baits, sprays, or dusts as soon as you finish seeding; do not wait until after the crop comes up and damage becomes noticeable.

Unfortunately, no fool-proof method of poisoning, using one treatment on a limited area, can be recommended with confidence. However, the first, early treatments are worth the most as the crops are most subject to damage in their early stages.

Poisoning Grasshoppers in Cover Crops

When cover crops emerge and damage begins, the fields from which the grasshoppers come may still be green or at least still standing uncut. Therefore, you may not wish to move spraying machinery through them. If you have a blower-type sprayer, you can blow spray into the edge of the crop and upon whatever grasshoppers are within reach while moving along just outside the edge of the crop. If you have a boom sprayer, fit it with side-delivery nozzles in order to apply the spray to the crop margin without entering it. If you use bait, there is little point in trying to distribute it into the maturing crop, because few grasshoppers will find and eat it. Therefore, only those grasshoppers that frequent the exposed bare soil

where the cover crop has been sown can be reached with bait.

If damage has already spread into the young cover crop, you must of course apply the poison along the front where the damage is occurring, but do not forget that many of the 'hoppers that caused the damage are probably sheltering back in the maturing crop, and that poison must be applied there, too.

Until the cover crop has enough growth to withstand grasshopper feeding, you may have to repeat the treatments as more grasshoppers find their way to the edge of the field.

If the green standing crop is heavily infested, with grasshoppers spread well into the field, probably the best way to handle the situation, if control is very urgent, is to engage a commercial operator to spray the infested part of the field from the air.

Poisoning Grasshoppers in Seedling Winter Grains

When winter wheat and fall rye are sown, the current year's crops have usually been harvested. If there is very little green vegetation growing in the stubble, the concentration of grasshoppers along the edge of the field may be more marked than in green, standing crops. Therefore poisoning will be easier since the infested area is smaller. There will also be no difficulty about moving spraying machinery through the infested area.

The same principles apply as in protecting cover crops: Kill as many grasshoppers as possible before the fall-sown grains emerge. If damage extends well into the field, apply poison not only along the front where damage is taking place, as far into the young crop as the grasshoppers have moved, but back in the stubble where the grasshoppers shelter when not feeding. As this source is reinforced by grasshoppers that keep finding their way to the edge of the field, repeated application of the treatment may be needed.

Chances for the Recovery of a Damaged Crop

Seedlings on an area under attack by grasshoppers are normally eaten down to the ground every day until no further re-growth can take place. If you kill the grasshoppers early, before this point is reached, you can expect some recovery of damaged plants.

NOTES ON EFFECTIVE SPRAYING

Sprays have in some cases been less effective when applied against mature grasshoppers in ripening crops. When spraying into such crops, or into stubble, it may be desirable to increase the rate of application to at least double the normally recommended rates.

The practical effectiveness of a spray deposit normally lasts not longer than a few days; increasing the rate of application will prolong the residual effectiveness of the application. For example, chlordane, instead of being applied at one-half to three-quarters of a pound of actual chlordane per acre, may be put on at one to one and one-half pounds; aldrin, instead of two to three ounces of actual insecticide, may be applied at four to six ounces. The total increase in cost will not be very great since normally the acreage involved in the treatment is not large.

Where the margin of a crop is being sprayed from outside the field, do not attempt to work against the wind.

FURTHER INFORMATION

Forecast maps, instructions for making mechanical bait spreaders, suggestions for applying sprays and dusts, and other information may be obtained from the following:-

Field Crop Insect Section, Canada Department of Agriculture at Brandon, Man.; Saskatoon, Sask.; or Lethbridge, Alta.;

Provincial Department of Agriculture at Winnipeg, Regina, or Edmonton; or your local agricultural representative or district agriculturist; and

Division of Entomology, Department of Agriculture, Ottawa, Canada.

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